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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/591,752

09/26/2006

Akiho Yokota

2006_1303A

3250

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7590

08/03/2009

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EXAMINER

PAGE, BRENT T

ART UNIT

PAPER NUMBER

1638

MAIL DATE

DELIVERY MODE

08/03/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,752	YOKOTA ET AL.	
	Examiner	Art Unit	
	BRENT PAGE	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 6-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 6-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election of Group III, claims 1 and 6-17 and SEQ ID NO:6 encoding SEQ ID NO:5 in the reply filed on 03/31/2009 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Accordingly, the Restriction Requirement is made FINAL. Claims 1 and 6-17 are pending and examined herein on the merits.

Claim Rejections - 35 USC § 112-2nd paragraph indefinite

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 16-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 16 recites the limitation "the original one" in line 2. There is insufficient antecedent basis for this limitation in the claim. There is no mention of an original plant in any of the preceding claims, and therefore no comparative basis for the claim.

Art Unit: 1638

Claim 17 recites the limitation "the wild variety" in line 2. There is insufficient antecedent basis for this limitation in the claim. There is no mention of a wild variety in any of the preceding claims, and therefore no comparative basis for the claim. The rejection to claim 17 would be obviated by inserting ---of said plant--- immediately after "the wild variety". Avoid adding New Matter.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 6-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokota et al (EP1036842, provided by Applicant, published 9/20/2000), in view of Maliga et al (US Patent 5877402), in view of Palatnik et al (US patent 6781034, filed 10/24/2001) and further, in view of Gegenbach et al (US Patent 6146867).

The claims are drawn to a vector comprising a gene encoding a protein having FBPase and/or SBPase activities between a Rubisco large subunit gene and an acetyl CoA carboxylase subunit gene, wherein the gene encoding a protein having at least FBPase activity wherein the protein has at least 60% or more homology to SEQ ID NO: 5, or wherein the nucleic acid encoding the protein has at least 60% homology to SEQ ID NO:6, wherein the vector has a

Art Unit: 1638

ribosome-binding site upstream of a translation initiation point and a terminator downstream, wherein Rubisco and acetyl Co-A carboxylase are derived from tobacco, a recombinant gene vector comprising said vector, a transformed chloroplast comprising said vector and a plant comprising said chloroplasts.

Yokota et al teach the transformation of tobacco with a construct comprising a gene encoding cyanobacterial fructose-1, 6-bisphosphatase/sedoheptulose-1,7 bisphosphatase, for expression in the chloroplasts of tobacco, wherein the nucleic acid sequence for encoding cyanobacterial fructose-1, 6-bisphosphatase/sedoheptulose-1,7 bisphosphatase is 100% identical to SEQ ID NO:6 and encodes SEQ ID NO:5 of the present invention, wherein a terminator is located downstream of the translation initiation site (see figure 1 for example) and wherein the resultant peptide is targeted to the chloroplast and wherein photosynthesis is increased 1.74 times relative to non-transformed plants (see pages 1-4 of the specification, particularly lines 54-56 of page 2 relating to targeting the protein to the chloroplasts and lines 10-14 of page 4 relating to the increased photosynthesis).

Yokota et al do not teach a ribosome binding site upstream of the translation initiation site, nor does Yokota et al teach Rubisco and Acetyl Co-A carboxylase encoding DNA sequences as part of the transformation vector.

Maliga et al teach the transformation of tobacco chloroplasts with a gene of interest located between the large subunit of Rubisco and Acetyl-CoA carboxylase, with a ribosome binding site upstream and a terminator downstream, wherein the ribosome binding site and terminator is from tobacco

Art Unit: 1638

(see claims 1-6, wherein the *rbcL* gene encodes the large subunit of Rubisco and the *accD* gene encodes Acetyl-CoA carboxylase, as understood in the art, and also 9th paragraph under "Summary of Invention" where it states "The 5' untranslated region comprises a DNA sequence that encodes a ribosome binding site", and Figures, for the constructs including the engineered 3' end terminators). Maliga et al also teach that the transformation of chloroplasts using their method increases protein production and activity (see 3rd paragraph under "Discussion" for example).

Given the state of the art, the disclosures by Maliga et al and Yokota et al, it would have been obvious to one of ordinary skill in the art to use the method taught by Maliga et al to target the transformation of the cyanobacterial fructose-1, 6-bisphosphatase/sedoheptulose-1,7 bisphosphatase taught by Yokota et al to chloroplasts to increase photosynthesis with greater efficiency as suggested by Maliga et al. All of the claimed vector elements are taught by Maliga et al. The gene of interest and the effect of photosynthesis is taught by Yokota et al. It was known in the art at the time of filing that transforming chloroplasts as taught by Maluiga et al would increase the transcripts of the gene of interest which would be expected to increase the level of photosynthesis of the plant consistent with the findings of Yokota et al.

No claims are free of the prior art.

No claims are allowed.

Art Unit: 1638

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRENT PAGE whose telephone number is (571)272-5914. The examiner can normally be reached on Monday-Friday 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on (571)-272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Brent T Page

/Anne Marie Grunberg/
Supervisory Patent Examiner, Art Unit 1638